UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

July 3, 2002

Thomas F. Mueller
Chief, Regulatory Branch
Department of the Army
Seattle District, Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for New Pier and Plaza Project at Howard Amon Park (NMFS No. WSB-01-498, COE #2001-1-01280)

Dear Mr. Mueller:

In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, the attached document transmits the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) and MSA consultation on the issuance of a permit for construction of the New Pier and Plaza Project at Howard Amon Park on the Columbia River in Benton County, Washington. The Army Corps of Engineers (COE) determined that the proposed action may affect, and is likely to adversely affect the Upper Columbia River steelhead (*Oncorhynchus mykiss*) and Upper Columbia River spring-run chinook (*Oncorhynchus tshawytscha*) Evolutionarily Significant Units (ESUs).

This BO reflects the results of a formal ESA consultation and contains an analysis of effects covering the Upper Columbia River steelhead and Upper Columbia River spring-run chinook in the Columbia River, Washington. The BO is based on information provided in the Biological Assessment (BA) sent to NMFS by the COE, and additional information transmitted via telephone conversations, fax, and e-mail. A complete administrative record of this consultation is on file at the Washington Habitat Branch Office.

The NMFS concludes that implementation of the proposed project is not likely to jeopardize the continued existence of Upper Columbia River steelhead or Upper Columbia River spring-run chinook or result in destruction or adverse modification of their Critical Habitat. In your review, please note that the incidental take statement, which includes a Reasonable and Prudent Measure and Term and Condition, was designed to minimize take.

The MSA consultation concluded that the proposed project may adversely impact designated Essential Fish Habitat (EFH) for chinook salmon. The Reasonable and Prudent Measure of the ESA consultation, and Term and Condition identified therein, would address the negative effects resulting from the proposed COE actions. Therefore, NMFS recommends that they be adopted as EFH conservation measures.

If you have any questions, please contact Dale Bambrick of the Washington Habitat Branch, Ellensburg Field Office at (509) 962-8911 Extension 221.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

Enclosure

Endangered Species Act - Section 7 Consultation

Biological Opinion

And

Magnuson-Stevens Fishery Conservation and Management Act

New Pier and Pedestrian Plaza Project at Howard Amon Park
Benton County, Washington
WSB-01-498

Agency: Department of the Army, Corps of Engineers

Consultation Conducted By: National Marine Fisheries Service
Northwest Region

Issued by: For Michael R Crouse
D. Robert Lohn
Regional Administrator

Date: July 9, 2002

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1.0 INTRODUCTION

This document has been prepared in response to a request for consultation under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, *et. seq.* (ESA) and transmits the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) and Essential Fish Habitat (EFH) consultation based on our review of the effects of the issuance of a permit (#2001-1-01280) to the City of Richland to construct a dock and moorage structures in Benton County, Washington. The project site is on the west bank of the Columbia River, within the Evolutionarily Significant Units (ESUs) of the endangered Upper Columbia River (UCR) steelhead (*Oncorhynchus mykiss*) and the endangered Upper Columbia River spring-run (UCRS) chinook (*Oncorhynchus tshawytscha*). Lake Wallula is also Essential Fish Habitat for chinook salmon. This consultation was initiated by the United States Army Corps of Engineers (COE) on December 3, 2001.

1.1 Background and Consultation History

This document is based on information provided in the Biological Assessment (BA) dated October 2001, and the following written correspondence. On December 3, 2001, NMFS received a letter initiating formal consultation (dated November 30, 2002) from the COE. On February 12, 2002, NMFS received a fax from SCM Consultants, Inc. (SCM), a consultant to the applicant, detailing design modifications and a draft mitigation plan. On March 22, 2002, NMFS received a fax from SCM detailing further modifications. On May 10, 2002, NMFS received a fax from SCM containing meeting notes from a May 1, 2002, site visit. On June 13, 2002, NMFS received a final memorandum from SCM via fax detailing modifications to the ramp, bulb surfaces, monitoring and adaptive management plan, removal of parts of the Hanford House dock, and clarifying construction timing. Information necessary to conduct formal consultation was assembled on June 13, 2002. Wyn Birkenthal (City of Richland) sent an email to NMFS on June 14, 2002, confirming that the modifications detailed in the June 13 memorandum were accurate.

Additionally, numerous telephone conversations between NMFS, COE, City of Richland, and SCM staff, and a June 4, 2002, meeting between NMFS, SCM, and Washington Department of Fish and Wildlife (WDFW) staff are included in the administrative record.

1.2 Description of the Proposed Action

The COE proposes to issue a permit to the City of Richland to install a ramp, floats, and piling in the Columbia River at Richland, Benton County, Washington, Section 11, Township 9N, Range 28E, at the terminus of Lee Boulevard at Howard Amon Park. The proposed dock and mooring piles would serve recreational and commercial tour boat operators. The applicant would implement a monitoring and adaptive management plan and remove several existing in/over-water structures to minimize the effects of the new structures. Additionally, the applicant would restore some riprapped shoreline.

1.2.1 Dock and Mooring Structures

The dock consists of a ramp reaching from shore to a float supported by piling. Additionally, two mooring piles would be installed. A lighting system beneath the float would be monitored and managed adaptively to reduce shading effects.

The proposed float consists of the 15 foot by 150 foot main deck, which would be roughly parallel to the shoreline, and two deck bulbs', approximately 10 feet by 40 feet sections attached to the shoreward side of the main deck. The shoreward edge of the bulbs would be approximately 60 feet from shore (at normal pool elevation). Water depths under the dock would range from 12-16 feet under the bulbs and 15-22 feet under the main deck. These depths are at normal pool elevation and are approximately two feet greater than most monthly minimums and 3 feet greater than annual minimums. The ramp would be 8 feet by 72 feet and connect a concrete abutment on shore to the upstream bulb. The main deck would be composed of interconnected concrete float sections. Artificial lights would be installed beneath the main deck and operated during daylight hours to reduce shading effects. The ramp and bulbs would be surfaced with metal grating with 59 percent surface voidspace. On the bulbs, grating would be installed with the long axis of grating openings in a generally north-south alignment. A portion of the upstream bulb may be composed of non-grated material to accommodate the ramp rollers. Underwater dock components would be white and cleaned regularly to maximize reflectivity.

The float would be anchored to nine 12 inches steel piles, installed with a drop-hammer pile driver. Two mooring piles would consist of larger material (up to 24 inches) and may be supported by as many as four braces that are no larger than 12 inches diameter. One mooring pile would be located 30 feet upstream from the float deck and the other would be 30 feet downstream. All in-water work would be completed between September 1 and March 1. Mooring piles would be installed between December 15 and March 1.

1.2.2 Monitoring and Artificial Lighting Adaptive Management Plan

The artificial lighting system (ALS) would be installed and operated to compensate for the shade produced by the main float deck. Water beneath the main deck would be illuminated in an attempt to match ambient light conditions. For example, artificial lighting would vary throughout the day, increasing from none at night to fully lighted in mid-day, and back to none at night. The applicant would establish a maintenance agreement for the ALS through a resolution to remain in effect for the life of the dock.

At this time, a specific plan detailing the locations, numbers, and types of lights to be installed has not been completed. Rather, the applicant and COE have agreed to specific standards for success to be evaluated through monitoring and would take corrective actions if the system does not perform adequately. The applicant would contract with an independent biologist to assist in design, monitoring, and if necessary, modification, of the ALS. Performance of the ALS would be evaluated in the following manner:

a. Monitoring would occur at least six times per year, once per month between March and September.

b. Four locations beneath the main deck would be selected at random at the beginning of each year. At each of these locations, light would be measured at two points in the water column, one mid-column and one near-bottom. Similar measurements would be made at one or more location(s) beneath the grated bulb sections.

c. Performance of the ALS would be considered adequate if light measured at each of the eight points beneath the main deck equals or exceeds the average light measured beneath the grated section(s) at similar depth under similar ambient light conditions for over half of the measurements taken during the year. For example, if the light level at one of the main deck mid-water points equaled or exceeded the light level of the average mid-water grating points during three or fewer of the six months of monitoring, the ALS would be considered unsuccessful.

d. If, after the completion of the annual monitoring plan, the ALS is not successful, the applicant would increase light levels beneath the main deck. Corrective measures may include but are not limited to adding lights, increasing intensity, and installing sun tunnels and/or prisms.

e. Monitoring would continue for a period of five years or until the ALS has performed successfully for two consecutive years, whichever is greater.

Concurrent with monitoring ALS performance as described above, the independent biologist would:

a. Conduct a census at the dock and mooring structures including the numbers and size/age classes of fish species.

b. Inventory bass nests associated with the dock and mooring structures.

c. Qualitatively assess macrophyte cover beneath and around the dock.

d. Measure light levels beneath the ramp and at least one location that is near, but not influenced by, the proposed dock.

e. Measure light levels at specific locations that fish are and are not occupying beneath the dock to assess fish preference of light microenvironments. These measurements would be made monthly for at least two years.

Annual monitoring reports would be provided to NMFS.

1.2.3 Shoreline Restoration Plan and Removal of Existing Structures

According to the shoreline restoration plan, the applicant would restore two small manmade peninsulas at Howard Amon Park by removing concrete debris and lowering and widening a portion of each peninsula. At each site, portions of the concrete curb, gutter, and old street material would be removed from the bottom of the slope at the water line. All Russian olive and locust trees would be removed. All other trees with a diameter greater than 10 inches would be retained. The rest shall be cut, abandoned, and anchored in the water. Round river rock 3-6 feet diameter would be placed at the bases of peninsula slopes. The peninsulas shall be replanted with willow plugs. If necessary, a temporary barrier would be constructed to keep pedestrians from trampling vulnerable plantings.

The applicant would remove several existing structures in the Columbia River as part of the proposed action. The Hanford House dock, located several hundred feet upstream from the proposed dock, would be modified by removing two nearshore finger floats. All parts of a dock adjacent to the Hampton Inn, several hundred feet downstream from the proposed dock, would be removed. This dock consists of an approximately 400 square foot float, a ramp, and several pilings in a low velocity nearshore area. Further downstream from the proposed structure, in the mainstem adjacent to Columbia Point Marina, six H-12 pilings would be removed. These pilings are not associated with over-water structures. All of these removal activities would occur between September 1 and March 1, no later than the completion of construction of the proposed dock.

1.2.4 Interdependent and Interrelated Activities

The project at Howard Amon Park also includes the construction of a pedestrian plaza. Although it is the in-water construction that would be permitted by the COE, the pedestrian plaza is part of the larger project proposal and would serve as a connection between the dock and parking areas. A concurrent activity would be the improvement of the Lee Boulevard turn-around and bicycle path, including construction of a bioswale to receive stormwater runoff that is currently discharged into the grass immediately above the shoreline. A silt fence would be installed downslope of all construction activity to contain any sediment-laden runoff originating at the construction site.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 C.F.R. 402.02). The action area for this project is the reach of the Columbia River impounded by McNary Dam (Lake Wallula). Although most effects of the action will be localized, increases in predator populations have the potential to affect listed salmonids throughout the reservoir.

2.0 ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Status of Species

2.1.1.1 Upper Columbia River Steelhead

UCR steelhead were listed as endangered pursuant to the ESA on October 18, 1997 (62 Fed. Reg. 43937). The ESU includes all naturally spawned populations of steelhead (and their progeny) in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border. Wells Hatchery stock steelhead are also part of the listed ESU.

The steelhead in the UCR ESU exhibit low abundance (Busby *et al.* 1997). Estimates of natural production in the ESU are well below replacement (approximately 0.3:1 adult replacement ratios estimated in the Wenatchee and Entiat Rivers). Five year (1989-93) average natural escapement estimates indicate 800 steelhead in the Wenatchee River and 450 steelhead in the Methow and Okanogan Rivers. Estimates of historical abundance (pre-1960's) specific to this ESU are available from fish counts at dams. Dam counts suggest a pre-fishery run size in excess of 5,000 adults for tributaries above Rock Island Dam (Chapman *et al.* 1994). The Federal Columbia River Power System (FCRPS) BO (NMFS 2000) concluded that significant improvements need to occur in the existing environmental baseline if this species is to recover.

For the UCR steelhead ESU as a whole, NMFS estimates that the median population growth rate (lambda) over the base period (1980-1996) ranges from 0.94 to 0.66, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000). NMFS has also estimated the risk of absolute extinction for the aggregate UCR steelhead population, using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years is 0.25 (Table B-5 in McClure *et al.* 2000). Assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100 percent), the risk of absolute extinction within 100 years is 1.00 (Table B-6 in McClure *et al.* 2000).

Because of data limitations, the Quantitative Analysis Report (QAR) steelhead assessments in Cooney (2000) were limited to two aggregate spawning groups—the Wenatchee/Entiat composite and the above-Wells populations. Wild production of steelhead above Wells Dam was assumed to be limited to the Methow system. Assuming a relative effectiveness of hatchery spawners of 1.0, the risk of absolute extinction within 100 years for UCR steelhead is 100 percent. The QAR also assumed hatchery effectiveness values of 0.25 and 0.75. A hatchery effectiveness of 0.25 resulted in projected risks of extinction of 35 percent for the Wenatchee/Entiat and 28 percent for the Methow populations. At a hatchery effectiveness of 0.75, risks of 100 percent were projected for both populations.

2.1.1.2 Upper Columbia River Spring-run Chinook

UCRS chinook were listed as endangered pursuant to the ESA on March 24, 1999 (64 Fed. Reg. 14308). The ESU includes all naturally spawned populations of chinook salmon in all river reaches accessible to chinook salmon in Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam in Washington, excluding the Okanogan River. Chinook salmon (and their progeny) from the following hatchery stocks are considered part of the listed ESU: Chiwawa River (spring run); Methow River (spring run); Twisp River (spring run); Chewuch River (spring run); White River (spring run); and Nason Creek (spring run).

The spring-run chinook abundance in the UCR ESU is quite low with escapements in 1994-1996 the lowest in at least the last 60 years (Meyers *et al.* 1998). At least 6 populations of UCRS chinook salmon in this ESU have gone extinct, and almost all remaining naturally spawning populations have fewer than 100 spawners. In addition to extremely small population sizes, long-term trends in abundance are downward, some extremely so.

An estimate of the overall run returning to spawn naturally in this ESU can be obtained from counts of adults at Priest Rapids Dam. The 5 year (1990-1994) geometric mean of this dam-count based estimate is approximately 4,880 spawners. Sufficient data were available to estimate trends in abundance for ten populations. All ten short-term trends were downward, with eight populations exhibiting rates of decline exceeding 20 percent per year.

There are no estimates of historical abundance for this ESU. The FCRPS BO (NMFS 2000) concluded that significant improvements in the environmental baseline are necessary if this species is to survive and recover. That BO concludes that survival must improve from 51 percent to 178 percent if this species is to survive and recover.

For the UCR spring chinook salmon ESU as a whole, NMFS estimates that the median population growth rate (lambda) over the base period (1980-1998) ranges from 0.85 to 0.83, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000). NMFS has also estimated median population growth rates and the risk of absolute extinction for the three spawning populations identified by Ford *et al.* (1999), using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (*i.e.*, hatchery effectiveness = 0), the risk of absolute extinction within 100 years ranges from 0.97 for the Methow River to 1.00 for the Methow and Entiat rivers (Table B-5 in McClure *et al.* 2000). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100 percent), the risk of extinction within 100 years is 1.00 for all three spawning populations (Table B-6 in McClure *et al.* 2000).

NMFS has also used population risk assessments for UCR spring chinook salmon and steelhead ESUs from the draft QAR (Cooney 2000). Risk assessments described in that report were based on Monte Carlo simulations with simple spawner/spawner models that incorporate estimated smolt carrying capacity. Population dynamics were simulated for three separate spawning populations in the UCR spring chinook salmon ESU, the Wenatchee, Entiat, and Methow populations. The QAR assessments showed extinction risks for UCR spring chinook salmon of 50 percent for the Methow, 98 percent for the Wenatchee, and 99 percent for the Entiat spawning populations. These estimates are based on the assumption that the median return rate for the 1980 brood year to the 1994 brood year series will continue into the future.

2.1.2 Evaluating the Proposed Action

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R. 402, *et. seq.* The NMFS must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of (1) defining the biological requirements of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributed to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. NMFS must identify any reasonable and prudent alternatives available for the action if it is determined that the action will jeopardize the listed species.

2.1.2.1 Biological Requirements

The relevant biological requirements are those necessary for UCR steelhead and UCRS chinook to survive and recover to naturally reproducing population levels at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

Biological requirements for these salmonids can be defined as properly functioning conditions (PFC) of habitats that are relevant to any steelhead or chinook life stage. These habitat conditions include all parameters of the matrix of pathways and indicators (MPI) described by NMFS (1996), *e.g.*, water quality, habitat access, flow/hydrology, and riparian reserves. The proposed action is likely to affect water quality, predator/prey dynamics, and shoreline stability.

Presently, the biological requirements of listed species are not being met under the environmental baseline. As a general matter, to improve the status of the listed species, improvements in the functional condition of habitat are needed.

2.1.2.2 Environmental Baseline

The environmental baseline represents the current set of basal conditions to which the effects of the proposed action are then added. Environmental baseline is defined as "the past and present impacts of all Federal, State, and private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or informal section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process" (50 C.F.R. 402.02).

The proposed project is located on the west bank of the Columbia River (Lake Wallula) in Benton County, Washington, Section 11, Township 9N, Range 28E. The major factors influencing the environmental baseline within the action area include: (1) the presence of hydroelectric dams; (2) shoreline development (3) the NMFS FCRPS BO.

Mainstem dams (McNary and Priest Rapids) are the most prominent features influencing the environmental baseline within the action area. Additional mainstem dams above and below the action area also influence the environmental baseline in the action area. In total, the mainstem dams have substantially changed the Columbia River's physical and biological characteristics. Specifically, dams have altered temperature profiles, inundated spawning habitat, created passage barriers, diminished sediment transport, prevented natural flow variation, eliminated lotic channel characteristics, and created habitat for species that prey on or compete with salmonids.

In terms of MPI indicators, the dams have caused a broad range of habitat degradation, contributing to high instream temperatures and high concentrations (supersaturation) of dissolved oxygen and nitrogen (Spence *et al.* 1996) in the Water Quality pathway. The Temperature indicator is *not properly functioning*.

Indicators in the Habitat Elements pathway are *not properly functioning* for the following reasons. When the Columbia River was transformed from a flowing body of water to a series of slow moving reservoirs, much of the historic habitat was inundated and habitat functions were lost. Sediment transport has been restricted to the extent that fine materials (silt, sand) settle out of the water column in the reservoirs instead of being flushed downstream (causing sedimentation or floodplain deposition) (NMFS 1996). Additionally, low water velocity and the physical presence of the dams (both upstream and in the action area) traps spawning substrates, preventing downstream recruitment (NMFS 1996). Off-channel habitat, refugia (remnant habitat that buffers populations against extinction), and large woody debris production has been reduced by inundating off-channel areas and historic riparian zones. Because the flow is highly regulated between dams, hydraulic variation is lacking. The dams have created several large reservoir pools, leading to the alteration of mesohabitat distribution patterns and a loss of habitat diversity.

The dams within the action area inhibit passage of listed salmonids, creating conditions where listed salmonids may be killed or injured by mechanical impingement or high dissolved gas levels (NMFS 1996, Spence *et al.* 1996). Additionally, the dams create false attraction to impassable areas, habitat for predators, and otherwise delay the progress of migrants. The direct presence of the dams, as well as the secondary problems that they create, result in *not properly functioning* conditions for the MPI Physical Barriers Indicator within the action area.

The Floodplain Connectivity indicator is *not properly functioning* in the action area. Dam operations, flow (reservoir) management, and the related inundation of off-channel rearing and floodplain areas have reduced the size, quality, and function of floodplains along the Columbia River (NMFS 2000).

Finally, dams have affected the Change in Peak/Base Flows indicator to the extent that the indicator is *not properly functioning*. Dam operations, by design, restrict and control the passage of water through river basins. The hydrosystem on the Columbia River, including the action area, affects the natural hydrograph by decreasing spring and summer flows and increasing fall and winter flows (NMFS 2000).

The action area is affected by varying levels of shoreline development in the form of marinas, docks, residential dwellings, roads, railroads, rip-rap, bulkheads, and landscaping. In terms of the MPI, shoreline development has primarily affected the Habitat Elements and Channel Condition and Dynamics pathways. Shoreline development has reduced the quality of nearshore salmonid habitat by (1) eliminating native riparian vegetation, (contributing to the *not properly functioning* status for Large Woody Debris and Refugia indicators); (2) displacing shallow water habitat with fill materials (contributing to the *not properly functioning* status for the Off-Channel Habitat indicator); and (3) by further disconnecting the Columbia River and the lower reaches of its tributaries from historic floodplain areas (contributing to the *not properly functioning* status for the Floodplain Connectivity indicator).

On December 21, 2000, NMFS issued the FCRPS BO (2000), finding that the FCRPS jeopardizes the continued existence and survival of UCRS chinook and UCR steelhead ESUs, among others. To avoid jeopardy, Federal agencies operating the FCRPS were provided a number of Reasonable and Prudent Alternatives (RPAs). In the RPAs, NMFS identified four categories of actions where survival and recovery of listed salmonids may be enhanced: hydroelectric, habitat, harvest, and hatcheries. It is important to note that a number of the RPAs involve off-site mitigation (*e.g.*, habitat improvements in estuaries and mainstem tributaries): modifying hydroelectric actions alone is insufficient to avoid jeopardy, as habitat improvement is also necessary.

The FCRPS BO illustrates that the environmental baseline is degraded within the action area and throughout the impounded Columbia and Snake Rivers. Maintaining current hydroelectric practices without additional improvements in habitat, harvest and hatchery areas would jeopardize the continued existence of UCRS chinook and UCR steelhead ESUs.

2.1.2.3 Factors Affecting Species Environment within Action Area

Section 4(a)(1) of the ESA and NMFS listing regulations (50 C.F.R. 424) set forth procedures for listing species. The Secretary of Commerce must determine, through the regulatory process, if a species is endangered or threatened based upon any one or a combination of the following factors; (1) the present or threatened destruction, modification, or curtailment of it habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

The proposed action includes activities that would have some level of effects with short-term impacts from the first category and the potential for long-term impacts from the third and fifth category. The characterization of these effects and a conclusion relating the effects to the continued existence of UCR steelhead and UCRS chinook is provided below, in sections 2.1.3 and 2.1.5.

Substantial habitat modifications affect listed UCR steelhead and UCRS chinook within the action area. The most conspicuous habitat modification is caused by dams on the Columbia River. Essentially, the dams have transformed portions of the river from a lotic (free flowing) to lentic (standing water) environment. The establishment of slow flowing or stationary waters has altered the physical characteristics of the river. Compared to the historic lotic setting, portions of the Columbia River now have different hydraulics (very slow moving), thermal characteristics (temperature stratification, heat storage, etc.), substrate conditions (diminished sediment transport and increased sedimentation), as well as large artificial barriers to passage (Spence *et al.* 1996).

Concurrent with physical changes, indirect biological transformation has also occurred. Exotic species that prey on salmonids, including percids and centrarchids, have become established in the Columbia River (Wydoski and Whitney 1979). These predators may feed directly on salmonids (Tabor *et al.* 1993, Anglea 1997) or compete for other food or habitat resources. Other native predators including the pikeminnow have exploited the impounded environment created by dams, although their predation rates are higher in the lower Columbia River (Faler *et al.* 1988).

A number of general anthropogenic factors have also influenced listed species. Along the shore of the Columbia River, transportation infrastructure, agriculture, commercial and residential development have displaced riparian and shallow water habitat used by juvenile salmonids. This development also contributes some quantity of runoff and pollution, which may include sediments, fertilizer, pesticides, and petroleum products. Additionally, the management of nonnative fishes as a fishery resource perpetuates their existence in the reservoirs and may contribute to predation on salmonids.

2.1.3 Effects Of the Proposed Action

The proposed permitting of the construction of a dock and mooring structures in the Columbia River is likely to adversely affect UCR steelhead and UCRS chinook. The portions of the Columbia River that flow through the action area are a migration corridor for steelhead and chinook adults and smolts and support juvenile rearing.

The ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species or critical habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." Indirect effects are those that are caused by the proposed action, are later in time, but are still reasonably certain to occur (50 C.F.R 402.02).

2.1.3.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated actions and interdependent actions. Future Federal actions that are not a direct effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated.

Adult steelhead and juvenile chinook and steelhead may inhabit the action area during the proposed construction period. Generally, the direct effects are related to the extent and duration of construction activities. The negative direct effects associated with the proposed project are likely to be short in duration and will be minimized through restrictions in timing of construction.

2.1.3.1.1 Turbidity

Dock installation and dock and pile removal will mobilize sediments, temporarily increasing local turbidity levels. In the immediate vicinity of the construction activities (several meters), the level of turbidity would likely exceed the natural background levels by a significant margin and potentially affect fish.

Quantifying turbidity levels, and their effect on fish, is complicated by several factors. First, turbidity from an activity will typically decrease as distance from the activity increases. How quickly turbidity levels attenuate is dependent upon the quantity of materials in suspension (e.g., mass or volume), the particle size of suspended sediments, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments. Second, the impact of turbidity on fish is not only related to the turbidity levels, but also the particle size of the suspended sediments.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (i.e., gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982; Sigler *et al.* 1984; Berg and Northcote 1985; Servizi and Martens 1992). The magnitude of these stress responses is generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35-150 NTU) accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect).

It is expected that turbidity arising from dock installation and dock and piling removal will be short-lived. In-water construction will occur between September 1 and March 1, when chinook adults and juveniles and steelhead juveniles are least likely to be present. Installation of mooring piles will likely cause the most disturbance and will occur between December 15 and March 1, when chinook and steelhead adults and juveniles are least likely to be present. Restricting in-water operations to these time periods minimizes the potential for adverse effects.

2.1.3.1.2 Pile Driving Noise

Pile driving typically causes temporary, intense underwater noise. The extent to which the noise would disturb fish would be related to the distance between the sound source and affected fish and by the duration and intensity of pile driving.

In the marine environment, Feist *et al.* (1996) have demonstrated that pile driving has tangible effects on salmonids. Among their conclusions: salmonids may be affected by pile driving sound within a radius of 600 meters of the sound source, and pile driving operations may affect the general behavior and distribution of salmonids.

The noise caused by pile driving would likely elicit an evasive response from steelhead and chinook near the sound source. This evasive response could in turn result in salmonids abandoning predator refugia or local foraging areas, temporarily increasing risks of predation (for juveniles) or diminishing foraging opportunities. The evasive response would also consume energy, potentially reducing growth.

Noise arising from pile installation may have minor negative effects on listed salmonids. Dock piles will be driven between September 1 and March 1, when chinook adults and juveniles and steelhead juveniles are least likely to be present. Installation of mooring piles will likely cause the most disturbance and will occur between December 15 and March 1, when chinook and steelhead adults and juveniles are least likely to be present. Restricting in-water operations to these time periods minimizes the potential for adverse effects.

2.1.3.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or they are a logical extension of the proposed action.

2.1.3.2.1 Predation

Predation by smallmouth bass, largemouth bass, and possibly other species are expected to be increased by addition of the proposed dock. While NMFS is not aware of any studies which have been done to specifically determine impacts of in/over-water structures on salmon, there are numerous predation studies which suggest that there likely is a serious predation impact from these structures. The proposed structure would be located in an area where listed salmonids migrate and rear, and in an area where predators are present.

There are four major predatory strategies utilized by piscivorous fish: they run down prey; ambush prey; habituate prey to a non-aggressive illusion; or stalk prey (Hobson 1979). Ambush predation is probably the most common predation strategy. Predators lie-in-wait, then dart out at the prey in an explosive rush (Gerking 1994). Predators may use sheltered areas that provide slack water to ambush prey fish in faster currents (Bell 1991).

Light plays an important role in defense from predation. Prey species are better able to see predators under high light intensity, thus providing the prey species with a relative advantage (Hobson 1979). Petersen and Gadomski (1994) found that predator success was higher at lower light intensities. Prey fish lose their ability to school at low light intensities, making them vulnerable to predation (Petersen and Gadomski 1994). Howick and O'Brien (1983) found that in high light intensities, prey species (bluegill) can locate largemouth bass before they are seen by the bass. However, in low light intensities, the bass can locate the prey before they are seen. Walters et al. (1991) indicate that high light intensities may result in increased use of shade-producing structures by predators. In the COE fisheries handbook, Bell (1991) states that "light and shadow paths are utilized by predators advantageously."

The effect of over-water structures is the creation of a light/dark interface that allows ambush predators to remain in a darkened area (barely visible to prey) and watch for prey to swim by against a bright background (high visibility). Prey species moving around the structure(s) are unable to see predators in the dark area under the structure(s) and are more susceptible to predation.

Salmon stocks with already low abundance are susceptible to further depression by predation (Larkin 1979). Juvenile salmonids, especially ocean type chinook (among others), may utilize backwater areas during their outmigration (Parente and Smith 1981). The presence of predators may force smaller prey fish species into less desirable habitats, disrupting foraging behavior, depressing growth (Dunsmoor *et al.* 1991).

Predator species such as pikeminnow (*Ptychocheilus oregonensis*), and introduced predators such as largemouth bass, smallmouth bass, black crappie (*Pomoxis nigromaculatus*) white crappie (*P. annularis*) and potentially, walleye (*Stizostedion vitreum*) (Ward *et al.* 1994, Poe *et al.* 1991, Beamesderfer and Rieman 1991, Rieman and Beamesderfer 1991, Petersen *et al.* 1990, Pflug and Pauley 1984, and Collis *et al.* 1995) likely utilize habitat created by over-water structures (Ward and Nigro 1992, Pflug and Pauley 1984) such as docks, piers, and floats. However, the extent of increase in predation on salmonids in the Columbia River resulting from over-water structures is not well known. The *Proposed Recovery Plan for Snake River Salmon* states that there should be no programs that improve habitat, production or survival of introduced species' and that "recruitment of these species into habitats of the listed species should be curtailed" (NMFS 1995) to allow for the recovery of listed ESUs. Although the ESUs affected by this project are not those in the Snake River, the predators, prey, and habitats are similar.

Major habitat types utilized by largemouth bass include vegetated areas, open water and areas with cover such as docks and submerged trees (Mesing and Wicker 1986). Colle *et al.* (1989)

found that, in lakes lacking vegetation, largemouth bass distinctly preferred habitat associated with docks, a situation analogous to the Columbia River. Marinas also provide wintering habitat for largemouth bass out of mainstem current velocities (Raibley et al. 1997). Bevelhimer (1996), in studies on smallmouth bass, indicates that ambush cover and low light intensities create a predation advantage for predators and can also increase foraging efficiency. Wanjala *et al.* (1986) found that adult largemouth bass (*Micropterus salmoides*) in a lake were generally found near submerged structures suitable for ambush feeding. Bell (1991) states that predators may use sheltered areas of low velocity to attack.

Ward (1992) found that stomachs of pikeminnow in developed areas of Portland Harbor contained 30 percent more salmonids than those in undeveloped areas, although undeveloped areas contained more pikeminnows.

When taken as a whole, NMFS believes the scientific literature relating to predator/prey behavior indicates that the addition of in/over-water structures such as docks, likely increases predator success under certain conditions. We believe those conditions exist at the site of the proposed docks. These conditions include:

1. Presence of ambush-type predators or those which might benefit from the presence of in/over-water structures. Species known to occur in the McNary pool include largemouth bass, smallmouth bass, resident rainbow trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), walleye, yellow perch (*Perca flavescens*), channel catfish (*Ictalurus punctatus punctatus*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus macrochirus*), pumpkinseed (*Lepomis gibbosus*), peamouth chub (*Mylocheilus caurinus*), and chiselmouth (*Acrocheilus alutaceus*). Of these, largemouth and smallmouth bass are known ambush feeders. The extent to which in/over-water structures convey advantage to non-ambush predators is unknown, but there may be rearing benefits.

2. Presence of prey of a size vulnerable to predation. Both UCR steelhead and UCRS chinook must pass the proposed project sites when migrating to the ocean. It is also likely that some individuals of these ESUs rear in the project area.

3. Conditions which will be altered to the benefit of predator species. Depth and velocities at the project site appear to be conducive to use by rearing and migrating salmonids. Water clarity at the sites is such that predator and prey species currently enjoy good visibility. The addition of in-water structure will likely provide cover/hiding refuge for predators and may improve spawning success. The addition of over-water structure will result in some level of shading which will provide hiding areas for predators from which they may capture salmonids.

Literature as well as personal observations substantiate the use of docks and other structures by juvenile predators for rearing purposes. Juvenile predators may derive a survival advantage from use of these structures by avoiding predation by their larger conspecifics (Hoff 1991; Carrasquero 2001). Additionally, smallmouth bass have been observed to preferentially locate nest sites near artificial structures (Pflug and Pauley 1984; Hoff 1991;K. Fresh pers. comm.). Hoff (1991) documents increases of successful smallmouth bass nests of 183 percent to 443 percent and increases in catch/effort for fingerlings of 607 percent to 3,840 percent in Wisconsin lakes after the installation of half-log structures, concluding that increasing nesting cover in lakes with low nest densities, poor quality and/or quantity of nesting cover, and low first-year recruitment rates can significantly increase recruitment. In the Columbia River, it is likely that bass production is limited by the scarcity of structure (D. Bambrick pers. comm.; K. Fresh pers. comm.), although abiotic factors may play a role (B. Steele pers. comm.). Therefore, the proposed action is likely to increase rearing and spawning habitat for predators, leading to a population increase and additional predation on juvenile salmonids within the reservoir.

Based on the presence of young salmonids, predators, and the additional shading and structure created by the proposed dock, piling, and associated boats, it appears likely that the proposed action would contribute to increased predation on listed salmonids. The relative roles that added in/over-water structure itself and shading play in benefitting predaceous fish is unknown, although the proposed dock will be a source of both.

The applicant has incorporated design elements to reduce the shading for all surfaces, including grating the ramp and bulbs and installing lights beneath the main float deck. Additionally, the removal of the dock at the Hampton Inn and the fingers of the Hanford House dock is expected to benefit salmonids by eliminating artificial nearshore shading. NMFS feels that these measures will substantially reduce effects to salmonids through shading as compared to an unmitigated traditional dock design.

Installation of the proposed dock at Lee Boulevard will increase in/over-water structure in the action area. The added structure will likely increase opportunities for predation on smolts by providing ambush cover and improve the suitability of the project site for juvenile predator rearing. Additionally, the nine dock piles and two mooring piles may increase spawning success of predators, especially smallmouth bass. Increases in ambush success, juvenile survival, and/or spawning success would likely lead to an increase in the population of adult predators in Lake Wallula. The corresponding negative effects on salmonids may be partially offset by the removal of 6 piles near Columbia Point Marina, the Hampton Inn dock, and part of the Hanford House dock by reducing predation attributable to artificial structure.

2.1.3.2.2 Littoral Productivity

Docks may also have some general effects on littoral productivity. The shade that docks create may inhibit the growth of aquatic macrophytes and other plant life (e.g., epibenthic algae and pelagic phytoplankton). These plants are the foundation for most aquatic food webs and their presence or absence affects many higher trophic levels (e.g., invertebrates and fishes). Consequently, the shade from docks may affect local plant/animal community structure or species diversity. At a minimum, shade from docks may affect the overall productivity of littoral environments (White 1975, Kahler et al 2000).

Primary productivity in the action area is generally low and dominated by benthic productivity because of high flushing rates. The proposed dock would cover the only macrophytes at the site, a narrow band of Eurasian milfoil (*Myriophyllum spicatum*) at 10-15 feet depth.

Surfacing the ramp and bulbs with grating, using reflective white materials for in-water components, and installing a lighting system designed to provide natural light conditions is expected to result in more natural light conditions beneath the proposed structure than would result from using traditional materials. However, it is unknown how effective these measures will be in limiting the expected reduction in primary productivity. Consequently, it is unknown to what degree the proposed action will negatively affect listed species through reducing photosynthesis, although it is reasonably certain that some reduction will occur. The removal of the Hampton Inn dock and parts of the Hanford House float are expected to partially offset reductions in productivity resulting from the installation of the Howard Amon dock.

2.1.3.2.3 Boating Activity

The addition of the new dock will increase use of the project site by commercial tour boats and possibly recreational boats. There are several impacts boating activity may have on listed salmonids and aquatic habitat. Engine noise, prop movement, and the physical presence of boat hulls may disrupt or displace nearby fishes (Mueller 1980, Warrington 1999a).

Boat traffic may also cause (1) increased turbidity in shallow waters, (2) uprooting of aquatic macrophytes in shallow waters, (3) aquatic pollution (through exhaust, fuel spills, or release of petroleum lubricants), and (4) shoreline erosion (Warrington 1999b). These boating impacts indirectly affect listed fish in a number of ways. Turbidity may injure or stress affected fishes, as discussed in more detail in section 2.1.3.1.1. The loss of aquatic macrophytes may expose salmonids to predation, decrease littoral productivity, or alter local species assemblages and trophic interactions. Despite a general lack of data specifically for salmonids, pollution from boats may cause short-term injury, physiological stress, decreased reproductive success, cancer, or death for fishes in general. Further, pollution may also impact fishes by impacts to potential prey species or aquatic vegetation.

2.1.3.3 Population Level Effects

Construction of the proposed dock at Howard Amon Park will result in short- and long-term impacts to listed salmonids. Conservative design criteria are expected to reduce the potential for long-term harm to listed fish by minimizing the extent of increased predation and reduced littoral productivity. The action will negatively affect listed salmonids in the action area, although the magnitude of this effect is unknown because the degree to which impacts associated with the new structure will be offset by the removal of nearshore structure is not clear. Offshore structure likely has a lesser impact on listed salmonids than nearshore structure per area/volume, but the overall impact is difficult to gauge, as the amount of structure added offshore will be greater than that removed nearshore. Making the most conservative assessment by assuming that nearshore and offshore structure have equivalent impacts on listed salmonids, we expect that the effects of the proposed action is unlikely to influence existing population trends or risks at the ESU scale for UCR steelhead or UCRS chinook.

2.1.4 Cumulative Effects

Cumulative effects are defined as “those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation” (50 C.F.R 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA

Riparian zones in the action area are not properly functioning, exhibiting little woody vegetation and shoreline stability, which is largely attributable to urban and agricultural encroachment. Although land use practices that would result in take of endangered species are prohibited by section 9 of the ESA, such actions do occur. NMFS cannot conclude with certainty that any particular riparian habitat will be modified to such an extent that take will occur. However, given the patterns of riparian development in the action area and rapid human population growth of Benton and Franklin counties (26.6 percent and 31.7 percent respectively, from 1990-2000, U.S. Census Bureau), it is reasonably certain that some riparian habitat will be impacted in the future by non-Federal activities.

2.1.5 Conclusion

NMFS has determined that the effects of the proposed actions will not jeopardize the continued existence of the UCR steelhead or UCRS chinook ESUs. The determination of no jeopardy is based upon the current status of the species, the environmental baseline for the action area, and the effects of the proposed actions.

The construction and installation of the dock at Howard Amon Park, as described and conditioned in this BO, would degrade baseline habitat functions locally, but would not appreciably reduce the functioning of already impaired habitat or retard the long-term progress of impaired habitat towards PFC at the population or ESU scale. This is due, in part, to the incorporation of conservative design criteria into the proposed action.

2.1.6 Reinitiation of Consultation

Consultation must be reinitiated if the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R. 402.16).

2.2 Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined as significant habitat modification or degradation that results in death or injury to listed species by “significantly impairing behavioral patterns such as breeding, spawning, rearing, migrating, feeding, and sheltering” (50 C.F.R. 222.102). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such takings is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the effects of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize take and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount Or Extent of Take Anticipated

The NMFS anticipates that incidental take of UCRS chinook and UCR steelhead is reasonably certain to result from project activities as described in the BO. Despite the use of the best scientific and commercial data available, NMFS cannot estimate a specific amount of incidental take of individual fish. However, the mechanisms of expected effects are explained below. The extent to which these mechanisms will affect fish can be described and are in the effects analysis of this BO. Direct harm or injury may result from installation and construction activities that generate turbidity and intense noise. Indirect harm through long-term habitat modification is likely to occur as well and may result in long-term population impacts to the species if the dock is not constructed as described in the BO. In the accompanying BO, NMFS determined that the level of anticipated take is not likely to result in jeopardy to the species.

2.2.2 Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of UCRS chinook and UCR steelhead:

1. The COE will minimize take by avoiding long-term degradation of aquatic habitat or enhancing aquatic predator habitat.

2. The COE will minimize take by maintaining long-term riparian function.

3. The COE will provide NMFS with information regarding the effects of the dock on aquatic habitat and biota, maintenance of predation minimization measures, and changes in management and configuration of the artificial lighting system.

2.2.3 Terms and Conditions

To comply with ESA section 7 and be exempt from the prohibitions of ESA section 9, the COE must comply with the terms and conditions that implement the reasonable and prudent measures. These terms and conditions are non-discretionary.

1. In order to minimize take by avoiding long-term degradation of aquatic habitat or enhancing aquatic predator habitat, the COE shall ensure that:

1.1 White dock components below the water surface (floats and the upper parts of pilings) are cleaned at least annually (prior to March 1) without chemicals such that the components remain bright and reflective through the spring outmigration of listed salmonids. This cleaning regimen may be altered at the discretion of the COE, the applicant, and the independent biologist during the ALS monitoring phase if done to investigate the capacity of white dock components to reduce impacts on salmonids (listed or otherwise).

1.2 Grated surfaces on the float deck and ramp are not used for storage or other purposes that would reduce natural light penetration through the structure.

1.3 The artificial lighting system is maintained and functional for the life of the dock.

1.4 No toxic or potentially toxic substances (such as gasoline, paint, etc.) shall be stored on the dock.

1.5 COE staff will inspect the site within one year of project completion to verify that the structure was constructed, the mitigation plan implemented, and the existing structures removed as described in the BA and updated by subsequent memoranda and section 1.2 of this document.

2. In order to minimize take by maintaining long-term riparian function, the COE shall ensure that vegetation planted as part of the mitigation plan is maintained until established and replaced as necessary such that survival by the end of the third growing season is at least 80 percent.

3. The COE shall ensure that at least the following information is provided to NMFS' Washington Habitat Branch at 510 Desmond Drive SE #103, Lacey, WA, 98503, referencing WSB-01-498:

3.1 Annual reports of light levels at least two depths (mid-column and near-bottom) for each of four randomly chosen sites beneath the main dock section, at least one site beneath grated bulb sections, at least one point beneath the ramp, and at least one control point that is not influenced by artificial structure. Fish monitoring data including at least numbers and size/age classes of salmonids and predaceous fish will also be included. These light and fish data would be collected at least once monthly between March and

September. Monitoring reports will be accompanied by assessments of the success of the artificial lighting system (ALS) and if lighting is not fully successful a plan detailing corrective measures to increase lighting before the next outmigration season (March 1 - September 1) will be included. These reports will be sent to NMFS by December 31 of every year until the artificial lighting system has performed successfully (defined in section 1.2) for two consecutive years or for five years, whichever is greater.

3.2 A final report at the conclusion of the monitoring and adaptive management phase of the ALS. If this phase is not concluded within seven years of construction, one report will be issued after seven years and a second report will be issued after conclusion. This report will contain:

3.2.1 An analysis of the success of the artificial lighting system and grating in reducing shading beneath and around the proposed dock.

3.2.2 A study of the relationship between fish occupation and light levels, with an emphasis on juvenile salmonids and their potential predators. This study would compare fish presence in light and dark environments beneath the dock and/or over time during which light levels may vary due to water quality, weather, boat presence, and improvements to the artificial lighting system. Data for comparisons of fish occupation in different light microenvironments for two or more years would be included.

3.2.3 Results of the bass nest surveys around the proposed structures.

3.2.4 An evaluation of the effect of the dock on benthic productivity and the effectiveness of grating and artificial lighting in minimizing this effect.

3.2.5 A comprehensive evaluation of the effect of the project on predators of salmonids through increasing predation success and recruitment and/or population density through increased spawning and rearing success and the effectiveness of grating and artificial lighting in reducing benefits to predators.

3.2.6 An assessment of the indirect effects on salmonids of the proposed project, if possible.

3.2.7 Recommended measures to reduce impacts to salmonids for similar future projects and further investigations to determine the effects of in/over-water structures on salmonids and measures to dampen those effects.

2.2.4 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or action area, to help implement recovery plans, or to develop additional information.

The NMFS encourages the COE to more fully assess the long-term impacts that dock construction may have on anadromous salmonids in the action area. Such an assessment would include long-term projections for the number of docks that the COE intends to permit in the action area, an estimate of the cumulative impact of these docks and their indirect effects on salmonid populations, and the ability of these populations to survive and recover while so impacted.

The NMFS encourages the COE to work with applicants for dock permits to ensure that future proposed actions result in little or no net increase in- and over-water structure. This goal may be attained by a combination of minimizing the size and/or number of proposed structural elements (especially piles) and identifying existing structures that can be removed or modified.

Further, NMFS encourages the COE to explore avenues to improve salmonid habitat and ecosystem function in the action area to compensate for habitat impacts associated with docks and boating activity and to carry out programs for the conservation of endangered species.

The NMFS must be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat. Accordingly, NMFS requests notification of the implementation of any conservation recommendations.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

EFH consultation with NMFS is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*), and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in Sections 1.3 and 1.4 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook salmon.

3.4 Effects of Proposed Actions

As described in detail in Section 2.1.3 of this document, the proposed action may result in detrimental short- and long-term impacts to a variety of habitat parameters. These adverse effects are:

3.4.1 Short-term degradation of water quality in the action area resulting from an increase in turbidity during in water construction.

3.4.2 Short-term increase in noise associated with pile driving.

3.4.3 Long-term increase in predation on juvenile chinook.

3.4.4 Long-term reduction in littoral productivity.

3.4.5 Long-term degradation in water quality and increased physical disturbance to river bottom and shore associated with increased boating activity.

3.5 Conclusion

NMFS believes that the proposed actions may adversely affect EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions that would adversely affect EFH. Because the conservation measures that the COE included as part of the proposed actions to address ESA concerns are also adequate to avoid, minimize, or otherwise offset potential adverse effects to chinook salmon to the maximum extent practicable, conservation recommendations are not necessary.

3.7 Statutory Response Requirement

Since NMFS is not providing conservation recommendations at this time, no 30-day response from the COE is required (MSA §305(b)(4)(B)).

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 C.F.R. 600.920(k)).

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